

## Renewable Energy Sources—Solar and Wind

### Think About It

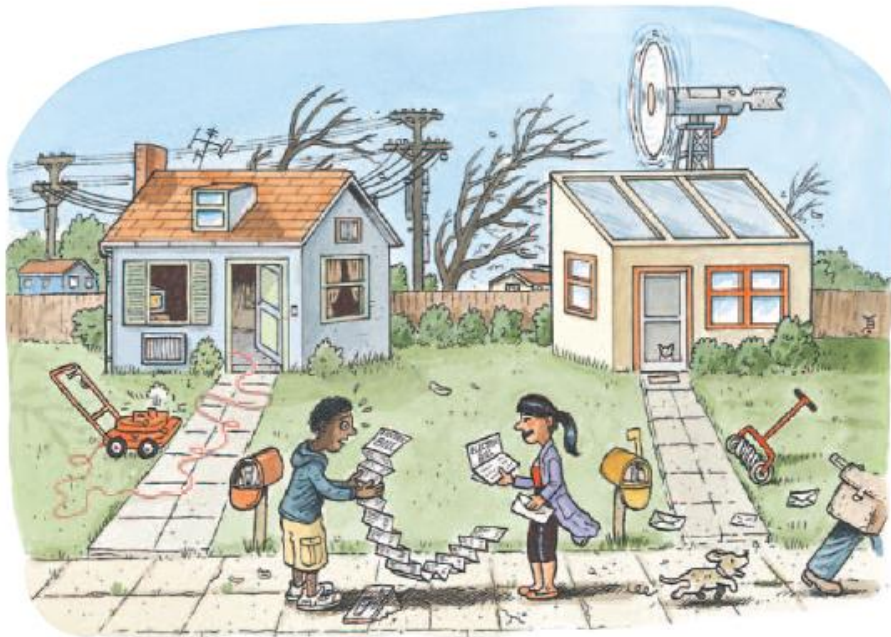
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- How can your community take advantage of solar energy to meet its energy needs?
- Is your community windy enough to make wind power feasible for electricity generation?



## WHAT DO YOU THINK?

## Activity 8

### Digging Deeper

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### Solar energy

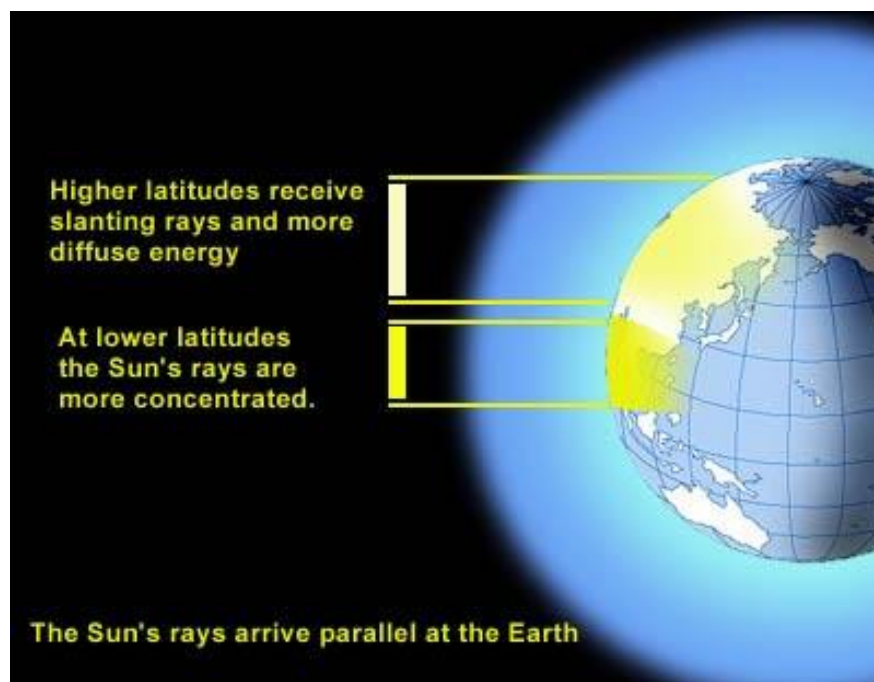
energy from the sun

forms include:

- direct solar radiation
  - photovoltaic
- indirect solar radiation
  - wind
  - biomass

### Insolation

the amount of solar energy that comes into contact with the Earth's surface

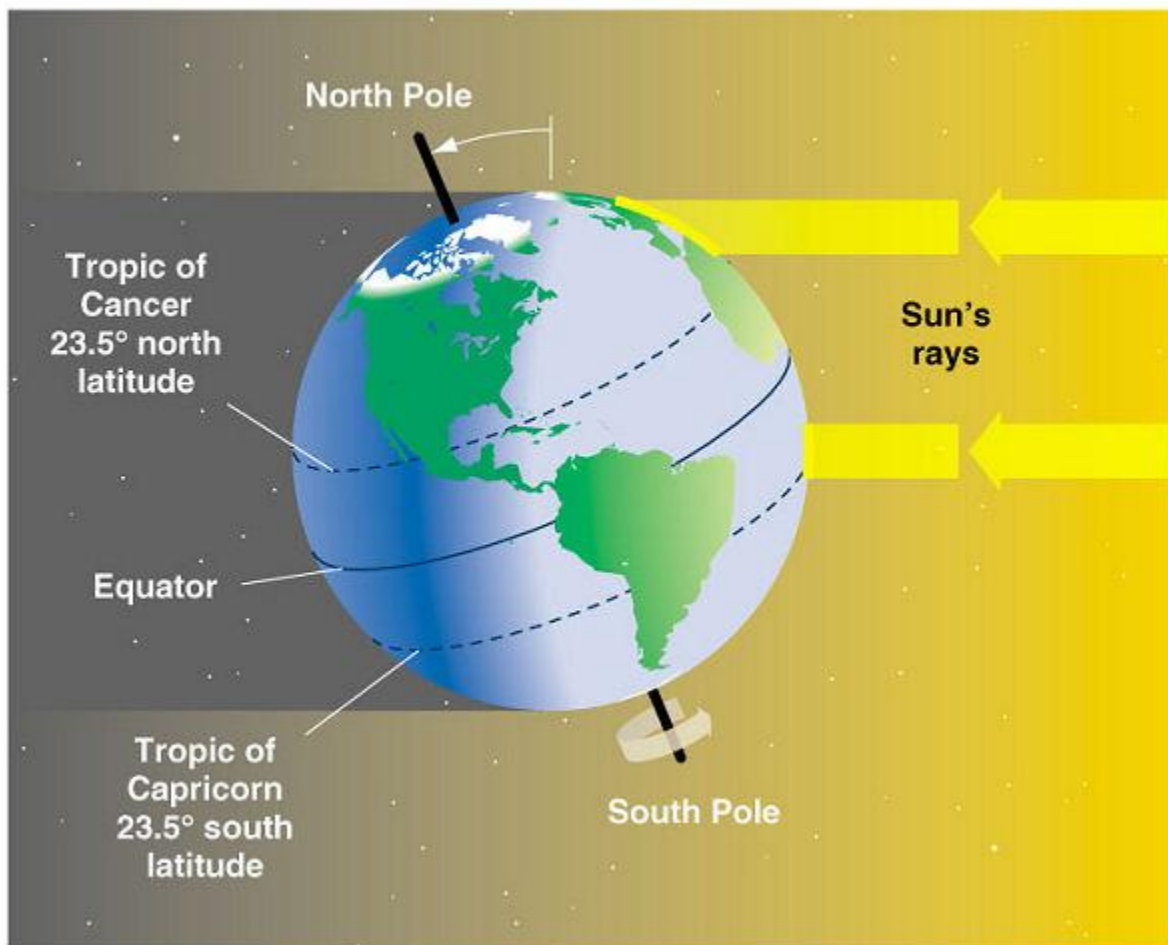


Insolation depends on:

- latitude
- season of the year
- time of day
- cloudiness of the sky
- clearness of the air
- slope of the land surface

Earth

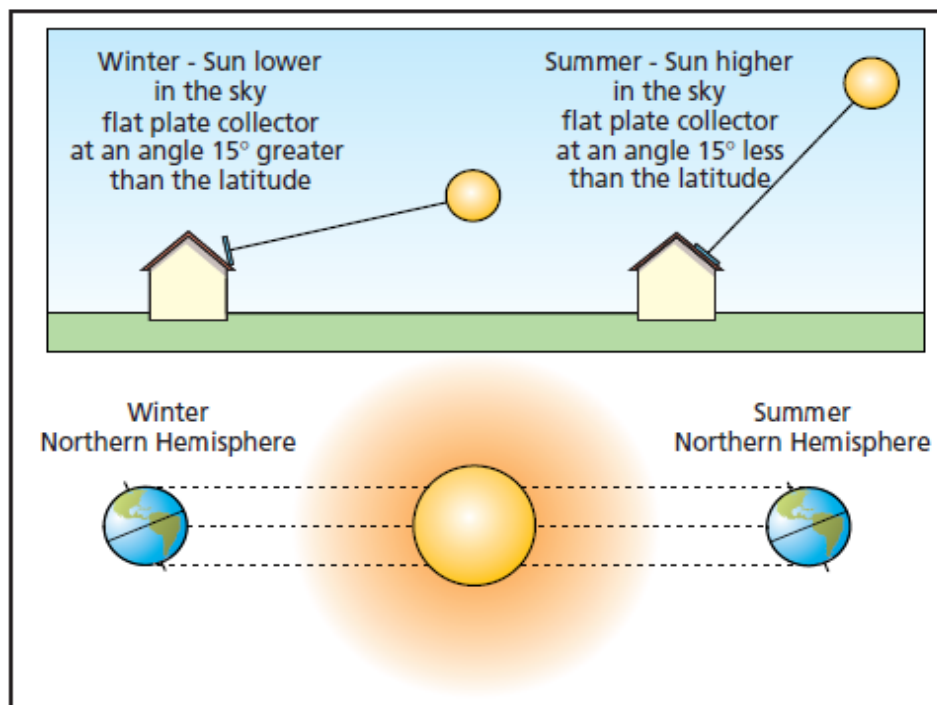
its axis of rotation is tilted  $23.5^\circ$  as it orbits the sun



Earth points toward the sun at one end of its orbit (summer), and away from the sun at the other end (winter)

In summer, the sun is at a high angle in the sky, causing the days to be long

In winter, the sun is at a low angle in the sky, causing the days to be short



<http://www.eram.k12.ny.us/education/sctemp/533f6c792a28a4a3199aff54741a3dbc/1248403241/solarAngle.swf>

[http://esminfo.prenhall.com/science/geoanimations/animations/01\\_EarthSun\\_E2.html](http://esminfo.prenhall.com/science/geoanimations/animations/01_EarthSun_E2.html)

Photovoltaic cell

a device that converts light energy from the sun directly into electricity



Wind power

has been increasingly used over the past 25 years to create electricity





Wind energy  
in the U.S.

California leads the country in  
the generation of electricity from  
wind turbines

Other areas that have potential  
include:

- the Rocky Mountains
- the flat Midwest states
- Alaska

Cost of wind  
power

in 2000, the cost of wind power  
was less than six cents per  
kilowatt-hour, making it  
competitive with electricity  
produced by coal-fired plants

